The CORN EARWORM in sweet corn

HOW TO CONTROL IT

U. S. DEPARTMENT OF AGRICULTURE

LEAFLET NO. 411

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If you grow sweet corn, you probably have seen the corn earworm.[1] The larvae (earworms) feed in the buds of young corn or in the husks, the silks, and the kernels of older corn. The adult is a moth.

Uncontrolled, the corn earworm is the most destructive insect of corn in the United States. It causes millions of dollars worth of damage every year; it sometimes damages sweet corn so severely that the crop is unmarketable.

You can control the corn earworm—and reduce crop losses—with DDT or Sevin.

Control of the earworm has made possible the rapid development of sweet corn industries in Florida and other areas in the South. Before effective control, commercial production of sweet corn in Southern States was impossible.

Although corn is the insect's preferred food, the earworm feeds on other crops. When it occurs on tomatoes, it is called the tomato fruitworm; and on cotton, the bollworm.

Damage

Only the larvae damage corn. (Adults do not feed on plant tissues.) Early in the season, they attack the buds or central shoots, feeding on the tender, unfolding leaves. This damage is commonly called budworm damage. When the tassels appear, the earworms feed on them, but this feeding rarely affects corn production.

The most serious damage occurs when the larvae attack the ears. At first, the larvae feed on the fresh silks, and may sever them. As the silks dry, the larvae shift to the kernels, especially those near the ear tip. They frequently penetrate to the middle of the ear.

Damaged sweet corn must be trimmed before it is marketed or processed at the cannery. The market price for trimmed corn is considerably lower than for untrimmed corn—and trimming increases the labor cost during processing.

a, Moth (or adult), and eggs on s
corn; d, pupa in a cell; e, color pho
1⅓ times natural size; b 5½ times

Development

The life cycle of the corn earworm is as follows: Egg, larva, pupa, and adult. In a very mild climate, such as that of southern Florida, parts of States bordering the Gulf of Mexico, and southern California, the insect completes this cycle in about a month and may produce up to 7 generations a year. In much of the Corn Belt, the insect has 3 or 4 generations a year. In the northernmost part of the country, it has only 1 generation.

[1] *Heliothis zea.*

b, eggs; c, earworm feeding in ear of
s of the earworm. (All except *b* about
tural size.)

The cycle begins when the female moths lay their eggs on the silks or on other parts of the corn plant. When the eggs are first laid, they are white. When they are ready to hatch into larvae, usually in 2 to 8 days, they are dusky brown.

The newly hatched larvae are whitish, and have black heads. Those that hatch on the leaves of young corn first feed in the central whorl of leaves, and then on the tassels and on the ears. Those that hatch on the silks feed on the silk mass inside the tips of the husks, and then on the ears.

The time required for larvae to reach full growth depends on temperature, and ranges from 13 to 28 days. Full-grown larvae are up to 1½ inches long.

Full-grown larvae vary in color. Some have conspicuous cream, yellow, brown, slate, or black stripes. Others do not have stripes, and may be pink, green, cream, or yellow.

Their feeding done, larvae drop to the ground, burrow an average of 2 to 4 inches into the soil, and construct cells in which to transform into pupae. The moths emerge in about 14 days. (The earworm passes the winter in the pupal stage.)

Moths live about 12 days, during which time they mate and the females lay eggs. A female may lay 400 to 3,000 eggs—the average is about 1,000.

Control

The corn earworm can be controlled most effectively with DDT or Sevin. Formerly, DDT to which a light mineral oil had been added, was recommended. Three applications, one every third day after silks began to appear, gave good control. However, partly because the sprayer did not provide proper agitation, some plant injury was experienced occasionally from the oil. For that reason, the oil has been omitted in recent years,

Budworm damage to young corn.

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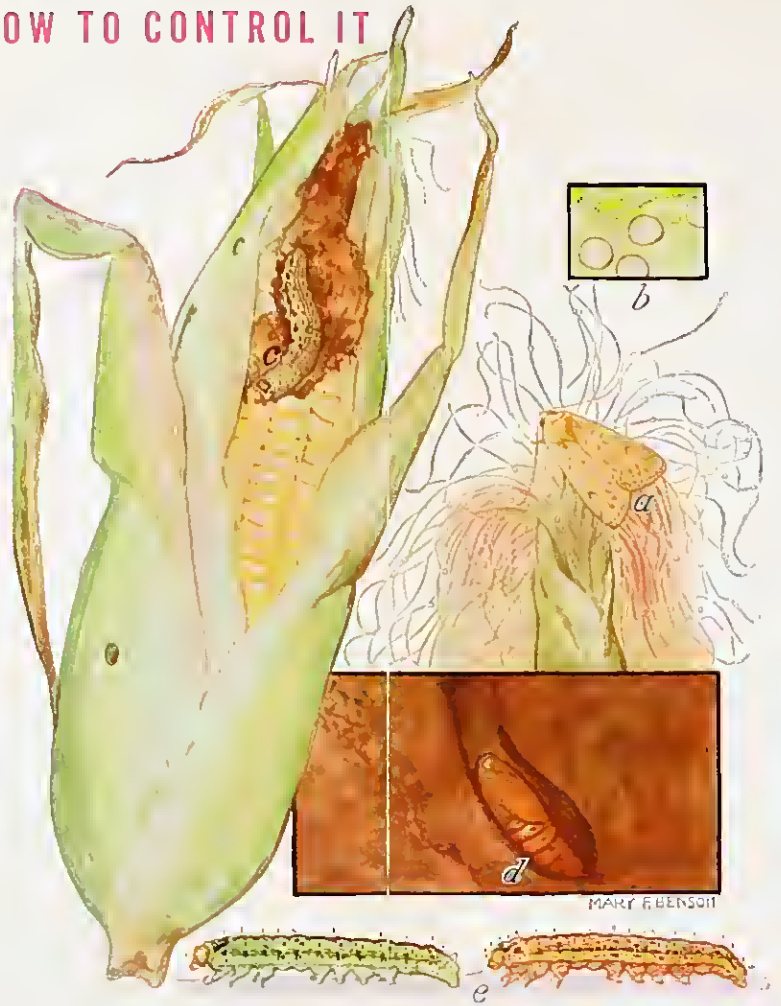

a, Moth (or adult), and eggs on silk; b, eggs; c, earworm feeding in ear of corn; d, pupa in a cell; e, color phases of the earworm. (All except b about 1⅓ times natural size; b 5½ times natural size.)

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Their feeding done, larvae drop to the ground, burrow an average of 2 to 4 inches into the soil, and construct cells in which to transform into pupae. The moths emerge in about 11 days. (The earworm passes the winter in the pupal stage.)

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but larger insecticide dosages and more applications are required.

The number of applications of this revised formulation will depend upon the severity of infestation. Only in the more northern areas of the United States should less than five applications be made and a maximum of eight applications is recommended. Where fewer than five applications are made (northern areas only) two days should elapse between treatments. With the minimum five-treatment schedule, one day should elapse between treatments and the maximum schedule calls for daily treatment. In all schedules, it is necessary to make the first application as the silks appear.

Additional Pointers: Shake the hand sprayer occasionally while spraying with Sevin to prevent it from settling out. Power sprayers provide a good overflow from the spray line into the tank to prevent settling. Clean out screens in the spray line and in spray nozzles frequently, especially with Sevin, to prevent clogging of the nozzles. If you use insecticide mixtures with a lower or higher insecticide content than those listed in this publication, use proportionately more or less of it in preparing the spray.

Sprayers

Hand sprayers. In gardens, use any good hand sprayer to apply the spray to the corn silks. The usual garden-type spray guns, compressed-air sprayers, or knapsack sprayers are satisfactory.

Power sprayers. On commercial acreages, use a high-clearance, 4-nozzles-per-row sprayer that produces a fine spray. Adjust the nozzles so that the spray hits the silks of ears. Nozzle size should be such as to give 25 gallons of spray per acre at 100 pounds pressure and operated at approximately three miles per hour. Use a 50-mesh screen in the spray nozzle to prevent clogging when using Sevin spray; a 100-mesh screen is best for DDT emulsion, but is too fine for Sevin spray.

To reduce budworm damage by the earworm before plants tassel or silk, use any practical sprayer that will apply the spray from above to the upper leaves, and to the ear shoots, if any are present.

Guide for preparing 25 gallons of spray (sufficient for treating one acre of corn) and 1 gallon of spray (for plot 17 x 100 feet)

Insecticide	Amount of insecticide to mix with sufficient amount of water for—	
	25 gallons of spray	*1 gallon of spray*
DDT, 25-percent emulsifiable concentrate	1 gallon (2 pounds)	⅓ pint
Sevin, 85-percent sprayable	1¾ pounds	1 ounce
Sevin, 50-percent wettable powder	3 pounds	2 ounces

Precautions

Both insecticides are poisonous. Handle them with care. Follow directions on the label and heed all precautions.

Do not feed husks or other parts of the corn plants treated with DDT to dairy or meat animals. Allow at least seven days to elapse after the last treatment before plant parts treated with Sevin are fed to animals.

To minimize losses of honey bees, make insecticide applications, when possible, during hours when they are not visiting the plants. Growers should notify beekeepers at least 48 hours before spraying large acreages, so that measures can be taken to protect the bees.

Prepared by the Entomology Research Division, Agricultural Research Service. This publication supersedes Leaflet No. 284, "Protect Your Garden Corn From Earworms."

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For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C. — Price 10 cents

Treating sweet corn in silk with high-clearance, self-propelled sprayer.